

CLAIMS:

Having thus described our invention, what we claim as new and desire to secure by

Letters Patent is:

- 1 1. A dynamic client-side breadcrumbing method for improving navigation of a plurality
2 of web pages within a Website, the method comprising:
 - 3 (a) generating a breadcrumb for each web page downloaded to a web
4 browser associated with a client from a web server associated with the Website, the
5 generated breadcrumb including navigation information for each downloaded web page;
 - 6 (b) storing breadcrumbs associated with web pages downloaded to the web
7 browser at the client;
 - 8 (c) updating the stored breadcrumbs with the generated breadcrumb to
9 form a breadcrumb navigation trail of breadcrumbs associated with navigation of the web
10 pages at the Website; and
 - 11 (d) displaying the breadcrumb navigation trail on each downloaded web
12 page for user selection.
- 1 2. The method according to Claim 1, wherein the navigation information includes a title
2 and a uniform resource locator for each downloaded web page.
- 1 3. The method according to Claim 1, further comprising a step of creating a client-side
2 cookie for storing the breadcrumbs associated with web pages downloaded to the web
3 browser.
- 1 4. The method according to Claim 2, further comprising a step of providing the title
2 associated with each downloaded web page within each download web page.
- 1 5. The method according to Claim 1, wherein a web server associated with the Website
2 embeds a breadcrumbing engine into each web page before each web page is downloaded
3 to the web browser, the breadcrumbing engine enabled for performing step (a)-(d).

1 6. The method according to Claim 1, wherein the web browser executes the
2 breadcrumbing engine embedded into each web page after downloading each web page.

1 7. The method according to Claim 1, wherein the step of updating the stored breadcrumbs
2 further comprises a step of determining whether the breadcrumb for each downloaded
3 web page is already stored at the client.

1 8. The method according to Claim 7, wherein the step of updating the stored breadcrumbs
2 further comprises a step of removing the breadcrumb and subsequent breadcrumbs from
3 the stored breadcrumbs if the breadcrumb is determined to be stored at the client.

1 9. The method according to Claim 8, wherein the step of updating the stored
2 breadcrumbs further comprises appending the breadcrumb to existing breadcrumbs stored
3 at the client to form the breadcrumb navigation trail if the breadcrumb is determined not
4 to be stored at the client.

1 10. The method according to Claim 3, wherein the step of creating further comprises the
2 steps of:

3 determining whether the client has a client-side cookie and creating the
4 client-side cookie if the client does not have it; and

5 setting a breadcrumb generated for a downloaded web page into the client
6 side cookie.

1 11. The method according to Claim 1, wherein the step of displaying the navigation trail
2 further comprises the following steps:

3 iterating thru the breadcrumbs in the breadcrumb navigation trail; and
4 displaying a last breadcrumb in the breadcrumb navigation trail as plain
5 HyperText Markup Language (HTML) and displaying preceding breadcrumbs as HTML
6 links to corresponding web pages.

1 12. A dynamic client-side breadcrumbing system for improving navigation of a plurality
2 of web pages within a Website, the system comprising:
3 (a) a web server associated with the Website transmitting web pages
4 requested by a client, the web pages embedding a breadcrumbing engine; and
5 (b) a web browser associated with the client downloading the web pages
6 and executing the breadcrumbing engine, the breadcrumbing engine for:
7 i) generating a breadcrumb for each web page downloaded to the
8 web browser, the generated breadcrumb including navigation information for each
9 downloaded web page,
10 ii) storing breadcrumbs associated with web pages downloaded to
11 the web browser at the client,
12 iii) updating the stored breadcrumbs with the generated
13 breadcrumb to form a breadcrumb navigation trail of breadcrumbs associated with
14 navigation of the web pages at the Website, and
15 iv) displaying the breadcrumb navigation trail on each downloaded
16 web page for user selection.

1 13. The dynamic client-side breadcrumbing system according to Claim 12, wherein the
2 navigation information includes a title and a uniform resource locator for each
3 downloaded web page.

1 14. The dynamic client-side breadcrumbing system according to Claim 12, wherein the
2 breadcrumbing engine is further for creating a client-side cookie to store breadcrumbs
3 associated with web pages downloaded to the web browser.

1 15. The dynamic client-side breadcrumbing system according to Claim 13, wherein a title
2 associated with each downloaded web page is provided within each downloaded web
3 page.

1 16. The dynamic client-side breadcrumbing system according to Claim 12, wherein the
2 web server embeds the breadcrumbing engine into each web page before each web page
3 is downloaded to the web browser.

1 17. The dynamic client-side breadcrumbing system according to Claim 12, wherein the
2 breadcrumbing engine further comprises determining whether the breadcrumb for each
3 downloaded web page is stored at the client.

1 18. The dynamic client-side breadcrumbing system according to Claim 17, wherein the
2 breadcrumbing engine further comprises removing the breadcrumb and subsequent
3 breadcrumbs from stored breadcrumbs if the breadcrumb is determined to be stored at the
4 client.

1 19. The dynamic client-side breadcrumbing system according to Claim 18, wherein the
2 breadcrumbing engine further comprises appending the breadcrumb to preceding
3 breadcrumbs stored at the client if the breadcrumb is determined not to be stored at the
4 client.

1 20. The dynamic client-side breadcrumbing system according to Claim 14, wherein the
2 breadcrumbing engine further comprises determining whether the client has the client-
3 side cookie and creating the client side cookie if the client does not have it, and the
4 breadcrumbing engine further setting a breadcrumb generated for a downloaded web
5 page into the client side cookie.

1 21. The dynamic client-side breadcrumbing system according to Claim 12, wherein the
2 breadcrumbing engine further comprises iterating thru the breadcrumbs in breadcrumb
3 navigation trail and displaying a last breadcrumb in the breadcrumb navigation trail as
4 plain HyperText Markup Language (HTML) and displaying preceding breadcrumbs as
5 HTML links.

1 22. A program storage device, tangibly embodying a program of instructions executable
2 by the machine to perform a dynamic client-side breadcrumbing method for improving
3 navigation of a plurality of web pages within a Website, the method comprising:
4 (a) generating a breadcrumb for each web page downloaded to a web
5 browser associated with a client from a web server associated with the Website, the
6 generated breadcrumb including navigation information for each downloaded web page;
7 (b) storing breadcrumbs associated with web pages downloaded to the web
8 browser at the client;
9 (c) updating the stored breadcrumbs with the generated breadcrumb to
10 form a breadcrumb navigation trail of breadcrumbs associated with navigation of the web
11 pages at the Website; and
12 (d) displaying the breadcrumb navigation trail on each downloaded web
13 page for user selection.

1 23. The program storage device according to Claim 22, wherein the navigation
2 information includes a title and a uniform resource locator for each downloaded web
3 page.

1 24. The program storage device according to Claim 22, the method further comprising
2 creating a client-side cookie to store breadcrumbs associated with web pages downloaded
3 to the web browser.

1 25. The program storage device according to Claim 23, the method further comprising a
2 step of providing the title associated each downloaded web page within each download
3 web page.

1 26. The program storage device according to Claim 22, wherein a web server associated
2 with the Website embeds a breadcrumbing engine into each web page before each web
3 page is downloaded to the web browser, the breadcrumbing engine enabled for
4 performing step (a)-(d).

1 27. The program storage device according to Claim 22, wherein the web browser
2 executes the breadcrumbing engine embedded into each web page after downloading
3 each web page.

1 28. The program storage device according to Claim 22, wherein the method step of
2 updating stored breadcrumbs further comprises a step of determining whether the
3 breadcrumb for each downloaded web page is already stored at the client.

1 29. The program storage device according to Claim 28, wherein the method step of
2 updating the stored breadcrumbs further comprises a step of removing the breadcrumb
3 and subsequent breadcrumbs from the stored breadcrumbs if the breadcrumb is
4 determined to be stored at the client.

1 30. The program storage device according to Claim 29, wherein the method step of
2 updating the stored breadcrumbs further comprises a step of appending the breadcrumb to
3 existing breadcrumbs stored at the client to form the breadcrumb navigation trail if the
4 breadcrumb is determined not to be stored at the client.

1 31. The program storage device according to Claim 24, wherein the step of creating
2 further comprises the steps of:
3 determining whether the client has a client-side cookie and creating the
4 client-side cookie if the client does not have it; and
5 setting a breadcrumb generated for a downloaded web page into the client
6 side cookie.

1 32. The program storage device according to Claim 22, wherein the method step of
2 displaying the navigation trail further comprises the following steps:
3 iterating thru the breadcrumbs in the breadcrumb navigation trail; and

4 displaying a last breadcrumb in the breadcrumb navigation trail as plain
5 HyperText Markup Language (HTML) and displaying preceding breadcrumbs as HTML
6 links to corresponding web pages.

1 33. A dynamic client-side breadcrumbing method for improving navigation of a plurality
2 of web pages within a Website, the method comprising:

3 (a) storing breadcrumbs associated with web pages downloaded to a web
4 browser from a web server associated with the Website at the client, the breadcrumbs
5 including navigation information associated with downloaded web pages and forming a
6 breadcrumb navigation trail of breadcrumbs associated with navigation of the web pages
7 at the Website;

8 (b) setting a time stamp corresponding to the breadcrumb navigation trail
9 and storing the time stamp at the client;

10 (c) downloading a subsequent web page and retrieving the time stamp
11 corresponding to the breadcrumb navigation trail stored at the client;

12 (d) determining whether a time interval between the time stamp and a time
13 corresponding to the subsequent downloaded web page exceeds a threshold; and

14 (e) enabling resumption of navigation according to the breadcrumb
15 navigation trail by enabling downloading of a web page according to navigation

16 information of a last breadcrumb in the breadcrumb navigation trail and displaying the
17 breadcrumb navigation trail on the downloaded web page if the time interval exceeded
18 threshold.

1 34. The method according to Claim 33, wherein the navigation information includes a
2 title and a uniform resource locator for each downloaded web page.

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1 35. The method according to Claim 33, further comprising a step of creating a client-side
2 cookie to store the breadcrumbs associated with web pages downloaded to the web
3 browser and the time stamp corresponding to the breadcrumb navigation trail.

1 36. The method according to Claim 33, wherein a web server associated with the Website
2 embeds a breadcrumbing engine into each web page before each web page is downloaded
3 to the web browser and the web browser executes the breadcrumbing engine embedded
4 into each web page, the breadcrumbing engine enabled for performing step (a)-(e).

1 37. The method according to Claim 36, the method further comprising a step of defining
2 the threshold within the breadcrumbing engine of each downloaded web page.

1 38. The method according to Claim 33, the method further comprising a step of
2 prompting a user regarding whether the user would like to resume navigation according
3 to the breadcrumb navigation trail.

1 39. The method according to Claim 38, wherein if the user chooses to resume navigation
2 according to the breadcrumb navigation trail, the method further comprises a step of
3 setting the time stamp associated with the breadcrumb navigation trail to the time
4 associated with downloading of the web page according to navigation information of a
5 last breadcrumb in the breadcrumb navigation trail and storing the time stamp at the
6 client.

1 40. The method according to Claim 38, wherein if the user chooses not to resume
2 navigation according to the breadcrumb navigation trail, the method further comprises the
3 steps of:

4 deleting all breadcrumbs stored at the client and storing a breadcrumb
5 generated for the subsequent downloaded web page at the client to form a new
6 breadcrumb navigation trail;

7 setting the time stamp to the time associated with the subsequent
8 downloaded web page and storing the time stamp at the client; and

9 displaying the new breadcrumb navigation trail on the subsequent
10 downloaded web page.

10 downloaded web page.

1 41. A dynamic client-side breadcrumbing system for improving navigation of a plurality
2 of web pages within a Website, the system comprising:

3 (a) a web server associated with the Website transmitting web pages
4 requested by a client, the web pages embedding a breadcrumbing engine; and
5 (b) a web browser associated with the client downloading the web pages
6 and executing the breadcrumbing engine, the breadcrumbing engine for:

7 i) storing breadcrumbs associated with web pages downloaded to a
8 web browser from a web server associated with the Website at the client, the
9 breadcrumbs including navigation information associated with downloaded web pages
10 and forming a breadcrumb navigation trail according to user navigation of web pages at
11 the Website,

12 ii) setting a time stamp corresponding to the breadcrumb
13 navigation trail and storing the time stamp at the client,
14 iii) determining whether a time interval between the time stamp
15 and a time corresponding to a subsequent downloaded web page exceeds a threshold, and
16 iv) enabling resumption of navigation according to the breadcrumb

17 navigation trail by enabling downloading of a web page according to navigation
18 information of a last breadcrumb in the breadcrumb navigation trail and displaying the
19 breadcrumb navigation trail on the downloaded web page if the time interval exceeds the
20 threshold.

1 42. The system according to Claim 41, wherein the navigation information includes a title
2 and a uniform resource locator for each downloaded web page.

1 43. The system according to Claim 41, wherein the breadcrumbing engine further
2 creating a client-side cookie to store the breadcrumbs associated with the web pages
3 downloaded to the web browser and the time stamp corresponding to the breadcrumb
4 navigation trail.

1 44. The system according to Claim 41, wherein the breadcrumbing engine is embedded
2 by a web server associated with the Website into each web page before each web page is
3 downloaded to the web browser.

1 45. The system according to Claim 41, wherein a threshold is defined within the
2 breadcrumbing engine of each downloaded web page.

1 46. The system according to Claim 41, wherein the breadcrumbing engine further
2 prompting a user regarding whether the user would like to resume navigation according
3 to the breadcrumb navigation trail.

1 47. The system according to Claim 46, wherein if the user chooses to resume navigation
2 according to the breadcrumb navigation trail, the breadcrumbing engine further setting
3 the time stamp associated with the breadcrumb navigation trail to the time associated
4 with downloading of the web page according to navigation information of a last
5 breadcrumb in the breadcrumb navigation trail and storing the time stamp at the client.

1 49. A program storage device, tangibly embodying a program of instructions executable
2 by the machine to perform a dynamic client-side breadcrumbing method for improving

3 navigation of a plurality of web pages within a Website, the method comprising the step
4 of:

5 (a) storing breadcrumbs associated with web pages downloaded to a web
6 browser from a web server associated with the Website at a client, the breadcrumbs
7 including navigation information associated with downloaded web pages and forming a
8 breadcrumb navigation trail according to user navigation of the web pages within the
9 Website;

10 (b) setting a time stamp corresponding to the breadcrumb navigation trail
11 and storing the time stamp at the client;

12 (c) downloading a subsequent web page and retrieving the time stamp
13 corresponding to the breadcrumb navigation trail stored at the client;

14 (d) determining whether a time interval between the time stamp and a time
15 corresponding to the subsequent downloaded web page exceeds a threshold; and

16 (e) enabling resumption of navigation according to the breadcrumb
17 navigation trail by enabling downloading of a web page according to navigation
18 information of a last breadcrumb in the breadcrumb navigation trail and displaying the
19 breadcrumb navigation trail on the downloaded web page if the time interval exceeds the
20 threshold.

1 50. The program storage device according to Claim 44, wherein the navigation
2 information includes a title and a uniform resource locator for each downloaded web
3 page.

1 51. The program storage device according to Claim 49, the method further comprising
2 creating a client-side cookie to store the breadcrumbs associated with web pages
3 downloaded to the web browser and the time stamp corresponding to the breadcrumb
4 navigation trail.

1 52. The program storage device according to Claim 49, wherein a web server associated
2 with the Website embeds a breadcrumbing engine into each web page before each web

3 page is downloaded to the web browser and the web browser executes the breadcrumbing
4 engine embedded into each web page.

1 53. The program storage device according to Claim 49, the method further comprising a
2 step of defining the threshold within the breadcrumbing engine of each downloaded web
3 page.

1 54. The program storage device according to Claim 49, the method further comprising a
2 step of prompting a user regarding whether the user would like to resume navigation
3 according to the breadcrumb navigation trail.

1 55. The program storage device according to Claim 54, wherein if the user chooses to
2 resume navigation according to the breadcrumb navigation trail, the method further
3 comprises a step of setting the time stamp associated with the breadcrumb navigation trail
4 to the time associated with downloading of the web page according to navigation
5 information of a last breadcrumb in the breadcrumb navigation trail and storing the time
6 stamp at the client.

1 56. The method according to Claim 54, wherein if the user chooses not to resume
2 navigation according to the breadcrumb navigation trail, the method further comprises the
3 steps of:

4 deleting all breadcrumbs stored at the client and storing a breadcrumb
5 generated for the subsequent downloaded web page at the client to form a new
6 breadcrumb navigation trail;

7 setting the time stamp to the time associated with the subsequent
8 downloaded web page and storing the time stamp at the client; and

9 displaying the new breadcrumb navigation trail on the subsequent
10 downloaded web page.

1 57. A breadcrumbing engine to be embedded into a plurality of web pages within a
2 Website for execution at a client web browser for improving navigation of the plurality of
3 web pages within the Website, the breadcrumbing engine comprising:

4 (a) mechanism for generating a breadcrumb for each web page
5 downloaded to a web browser associated with a client from a web server associated with
6 the Website, the generated breadcrumb including navigation information for each
7 downloaded web page;

8 (b) mechanism for storing breadcrumbs associated with web pages
9 downloaded to the web browser at the client;

10 (c) mechanism for updating the stored breadcrumbs with the generated
11 breadcrumb to form a breadcrumb navigation trail of breadcrumbs associated with
12 navigation of the web pages at the Website; and

13 (d) mechanism for displaying the breadcrumb navigation trail on each
14 downloaded web page for user selection.

1 58. A breadcrumbing engine to be embedded into a plurality of web pages within a
2 Website for execution at a client web browser for improving navigation of the plurality of
3 web pages within the Website, the breadcrumbing engine comprising:

4 (a) mechanism for storing breadcrumbs associated with web pages
5 downloaded to a web browser from a web server associated with the Website, the
6 breadcrumbs including navigation information associated with downloaded web pages
7 and forming a breadcrumb navigation trail according to user navigation of web pages at
8 the Website;

9 (b) mechanism for setting a time stamp corresponding to the breadcrumb
10 navigation trail and storing the time stamp at the client;

11 (c) mechanism for determining whether a time interval between the time
12 stamp and a time corresponding to a subsequent downloaded web page exceeds a
13 threshold; and

14 (d) mechanism for enabling resumption of navigation according to the
15 breadcrumb navigation trail by enabling downloading of a web page according to

16 navigation information of a last breadcrumb in the breadcrumb navigation trail and
17 displaying the breadcrumb navigation trail on the downloaded web page if the time
18 interval exceeds the threshold.